36 (35)
58. The method of claim 57, comprising spraying additional chlorine dioxide solution on the produce while the produce is on the conveyor and is being moved by the conveyor away from the bath.

REMARKS

Claims 1-15 and 22-28 have been cancelled. New claims 29-58 have been added. Claims 16-20 have been amended so that they now depend from new claim 29. Claim 21 that depends from claim 20 remains in the application unchanged.

Claims 29, 42 and 55 are independent claims. Claims 29 and 42 specify measuring the oxidation reduction potential of the process water and generating additional chlorine dioxide solution in response to the oxidation reduction potential being below a predetermined level, and admixing the additional chlorine dioxide solution with the process water.

Claim 29 and claims 30-41 that depend either directly or indirectly from claim 29 specify that during treatment process water is removed from the tank and is directed through a control loop and then back to the tank. The oxidation reduction potential of the process water is determined by testing the process water that is in the control loop.

Claim 42 and claims 43-54 that depend either directly or indirectly from claim 42 specify providing a chlorine dioxide generator, and storage containers of components that when mixed, react and produce a chlorine dioxide solution, and a pump for each component, located between the storage container for the component and the chlorine dioxide generator, and a controller for the pumps, and an oxide reduction potential probe in the process water. These claims further specify using the chlorine dioxide generator to generate a chlorine dioxide solution and deliver it into the process water. They also specify using the oxidation reduction potential probe to measure the

oxidation reduction potential of the process water. They further specify using the controller to turn on the pumps and pump the components from their containers to the chlorine dioxide generator in response to the oxidation reduction potential of the process water being too low, so that the components will be pumped to the chlorine dioxide generator and additional chlorine dioxide solution will be generated. In addition, these claims specify delivering the additional chlorine dioxide solution from the generator to the process water.

Claims 55-58 specify treating fresh produce to remove debris from the produce and inhibit the growth of fungus. The method comprises continuously submerging produce in a bath of process water and providing a chlorine dioxide solution in the process water. The chlorine dioxide solution cleans debris from the surface of the produce and at the same time inhibits the growth of fungus on the produce. Claims 55-58 continue by specifying that the treated produce is removed from the tank by a conveyor that moves the produce away from the tank.

Busta 3,814,820 is concerned with treating lettuce and other salad ingredients in a way that includes washing in a cleaning solution, followed by rinsing in potable water, followed by contact with an aqueous sanitizing agent, optionally followed by rinsing again in potable water, followed by contact with a discoloration inhibitor, and followed by extraction of excess discoloration inhibitor. The lettuce and/or other salad ingredients are sanitized by contacting them with an aqueous solution of hypochlorites, chlorine dioxide or hydrogen peroxide. In the only example set forth in the patent, dismembered lettuce is sanitized by dipping it into an aqueous solution of sodium hypochlorite at 35° F. for thirty seconds. The concentrate of sodium hypochlorite is sufficient to provide 25 p.p.m. chlorine. There is no disclosure in this patent of monitoring a bath of chlorine dioxide solution and generating additional chlorine dioxide solution and adding it to the process water when monitoring shows that the oxidation reduction potential of the process water is too low. The patent does not

teach during treatment, removing process water from a tank and directing it through a control loop and then back to the tank. It does not teach monitoring the oxidation reduction potential of the process water by testing the process water that is in a control loop. It does not teach providing a chlorine dioxide generator, and storage containers of components that when mixed react and produce a chlorine dioxide solution, and a pump for each such component, located between the storage container for the component and the chlorine dioxide generator, and a controller for the pumps, and an oxidation reduction potential probe in the process water. It does not teach using such a probe to measure the oxidation reduction potential of the process water, and then use the controller to turn on the pumps and pump the components from their containers to the chlorine dioxide generator in response to the oxidation reduction potential of the process being too low, so that the components will be pumped to the chlorine dioxide generator and additional chlorine dioxide solution will be generated and then delivered from the generator to the process water. Also, this patent does not teach treating the produce by submerging the produce in a bath of produce water and then removing the treated produce from the bath onto a conveyor and using the conveyor to move the produce away from the tank.

Dave, 4,001,443 is concerned with improving the shelf life of packaged, cut leafy vegetables. According to Dave, 4,001,443, the cut leafy vegetables are brought into contact with an aqueous solution having from about 70 to 150 volume parts per million of chlorine. In the only disclosed example, shredded lettuce was placed into a wire basket and the basket was immersed in a water bath containing 80 volume parts per million of chlorine and one percent by weight potassium monobasic phosphate to buffer the pH of the bath to about 6. This method is not what is being claimed.

Mason et al., 4,889,654 is concerned with disinfecting equipment by use of a foam form of chlorine dioxide. It teaches mixing water, a foam generating agent and chlorine dioxide with a gas

in a foam generator to form a disinfectant foam. The disinfectant foam is sprayed on a surface to be treated. The disinfectant foam is allowed to remain in contact with the surface for a period of time sufficient to allow cleaning and disinfection of the surface. The disinfectant foam is then removed from the surface.

Claims 16-21 and 29-59, constituting all of the claims that are presently in the application, all specify on site generation of the chlorine dioxide solution. Specifically, claim 29 and claims 16-21 and 30-41 that depend from claim 29 specify the step of "generating a chlorine dioxide solution on site." This step is the fourth step in independent claim 29. Claim 42 and claims 43-54 which depend from claim 42 specify "providing on site a chlorine dioxide generator," etc. and "using the chlorine dioxide generator to generate on site a chlorine dioxide solution and deliver it into the process water." Claim 55 and claims 56-58 which depend from claim 55 specify "generating on site a chlorine dioxide solution and admixing said process water." This on site generation is an important feature of the invention. See page 14 of the description, lines 18-26, whereat it is stated:

> In addition, the present invention provides a safe and effective method for the use of a chlorine dioxide solution by allowing for on site generation. According to the present invention, small amounts of chlorine dioxide solutions, including solutions with up to 50% active chlorine dioxide, can be generated on site as needed. Accordingly, the present invention provides environmental and safety benefits by eliminating the need for the shipment, storage, and handling of hazardous chlorine dioxide solutions.

Busta 3,814,820 makes mention of using chlorine dioxide as a sanitizing agent but does not disclose on site generation of the chlorine dioxide. Mason et al. 4,889,654 also discloses chlorine dioxide but does not teach on site generation of the chlorine dioxide. Rather, it discloses using a foam generator to foam a disinfectant foam that includes chlorine dioxide. It appears from the disclosure that the foam is then transmitted to where it is to be used for cleaning the surfaces of

equipment. Dave, 4,001,443 does not teach using chlorine dioxide, let alone the "on site" generation of chlorine dioxide.

Claim 16 depends from claim 29 and specifies that the on site generation of chlorine dioxide solution is by the reaction of a solution comprising sodium chlorite with a solution comprising phosphoric acid. Claim 17 depends from 29 and specifies that the on site generation of the chlorine dioxide solution is by the reaction of a solution comprising sodium chlorite and sodium chloride with a solution comprising phosphoric acid. Claim 18 depends from claim 29 and specifies that the on site generation of the chlorine dioxide solution is by the reaction of a solution comprising sodium chlorite with a solution comprising phosphoric acid and sodium 2-ethylhexyl sulphate. Claim 19 depends from claim 29 and specifies that the on site generation of chlorine dioxide solution is by the reaction of a solution comprising sodium chlorite and sodium chloride with a solution comprising phosphoric acid and sodium 2-ethylhexyl sulphate. Claim 20 depends from claim 29 and specifies the step of monitoring the pH of the process water admixture with the chlorine dioxide solution and maintaining the pH of the process water admixed with the chlorine dioxide solution below about 11. Claim 21 depends from claim 20 and further specifies maintaining the pH of the process water admixed with the chlorine dioxide solution between about 2 and 10.5. These features of claims 16-21 are not disclosed by any of the reference patents. The fact that Dave 4,001,443 teaches maintaining a chlorine bath of a pH of about 5 and 7 is not a teaching of the claimed process and the claimed pH control.

Claim 30 depends from claim 29 and further specifies admixing the additional chlorine dioxide solution into the process water as it flows through the control loop. This feature is not disclosed by any of the reference patents.

Claims 31, 33, 35, 37, 39, 41, 43, 45, 47, 49, 52, 54, 56 and 58 specify removing the treated produce from the tank onto a conveyor, using the conveyor to move the produce away from the tank, and during movement spraying a second chlorine dioxide solution onto the produce. Claims 32, 36, 40, 44, 48, 53 and 57 specify the use of a conveyor and providing the conveyor with rotating brushes and rotating the brushes while they are in contact with the produce, so that the brushes will brush the produce and mechanically remove debris and residue from the produce. These features are not disclosed by any of the reference patents. Claim 34 depends from claim 29 and specifies providing a chlorine dioxide generator, and storage containers of components that when mixed react and produce a chlorine dioxide solution, and a pump for each such component, located between the storage container for the component and the chlorine dioxide generator, and a controller for the pumps, and an oxidation reduction potential probe in the process water passing through the control loop. Claim 34 further specifies using the probe to measure the oxidation reduction potential of the process water and using the controller to turn on the pumps and pump the components from their containers to the chlorine dioxide generator in response to the oxidation reduction potential of the processed water being too low, so that the components will be pumped to the chlorine dioxide generator and additional chlorine dioxide solution will be generated. Claim 34 concludes by specifying the step of delivering the additional chlorine dioxide solution from the generator to these process water. The features of claim 34 are not disclosed by any of the reference patents.

Claims 38-40 and 46-54 specify that the produce is apples. There is no reference patent that teaches the on site generation of chlorine dioxide and the use of it in process water for treating apples.

Claim 50 specifies placing apples in containers and then submerging the containers in the tank, so that the apples will float up out of the containers, and removing the containers from the tank when they are empty of apples. This feature is not disclosed by any of the reference patents.

Claim 51 depends from claim 49 and specifies removing the treated apples from the tank onto a conveyor and using the conveyor to move the apples away from the tank. This feature is not disclosed by any of the reference patents.

It is submitted that claims 16-21 and 29-58, the claims now in this application, are all allowable. Accordingly, early reconsideration and allowance of the application is requested.

Respectfully submitted,

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